

Even though this topic has been beaten to death and s2000ellier has an excellent [DIY Axle Nut TSB](#), I decided to collaborate with Billman to make another. Here's a summary of the steps and a detailed DIY.

1. Remove Wheel Center Caps
2. Unstake Nut (optional)
3. Remove Nut & Grease Nut face
4. Tighten Nut to Original Position (~180 ft-lbs)
5. Tighten Nut approximately 60 degrees
6. Stake Nut
7. Replace Center Cap

Recommended Tools:

- trim removal tool
- [multi-purpose grease](#)
- staking tools
- [36mm socket](#) and extension
- [heavy duty ratchet](#) or breaker bar (3/4" drive highly recommended)
- *depending the length of the ratchet/breaker bar, you may also need a cheater pipe*



Telescoping 3/4" ratchet



Staking tools, unstaking horizontal, skating vertical

1. Remove Wheel Center Caps

Park the car, apply the emergency brake and leave it in gear. This is easier to do with the car on the ground, than jacked up. Taking care to not scratch them, remove the center caps with trim removal tools or whatever you have available.



Center cap being removed.

2. Unstake Nut (optional)

Use the staking tool to unstake the nut. It seems that you can remove the nut without unstaking, but it doesn't take very long to do.



An untouched staked wheel nut from the factory. Notice that the paint line follows from axle to the nut.

3. Remove Nut & Grease Nut face

Remove the nut. You can use an impact wrench for this. Using multipurpose grease, grease the face of the face of the nut only (not the threads).

4. Tighten Nut to Factory Original Position (150-180 ft-lbs)

You can use an impact wrench to do this. This is to help verify that the final tightening is done from the proper starting point. If your axle nuts were still at the torque setting from the factory, this will be the position that you found them in. If the nuts had already been tightened they won't be, and you should have left them alone.



An axle nut re-installed at 180 ft-lbs. Notice that it's slightly past the original position.

5. Tighten Nut approximately 60 degrees

Using the ratchet/breaker bar, you'll be tightening the nut another 60 degrees. One easy way to do this is to set the ratchet slightly above horizontal and then push up until it's almost vertical. Even though Billman makes it look easy, you should make sure you have a lot of leverage and you will have to put some muscle into it.



Starting position for final tightening.



Ending position for final tightening.



Axle nut in its final position.

The corners of the nut should point in the same directions as they when the nut was torqued to 180 ft-lbs

6. Stake Nut

Use the staking tools to stake the nut. The tool should have a rounded edge so you don't cut the nut.

7. Replace Center Cap

Replace the center cap with the H pointing away from the valve stem.



Installed center cap.



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[SIZE="4"]Purpose[/SIZE]

The axle nut TSB is needed to properly seat the wheel bearing inner races on the rear hub. It also maintains the clamping force of the axle-hub stack. The factory torque setting is insufficient and allows for the wheel bearing to move on the hub. Tightening the axle nut prevent this motion and prevents wear on the parts.



Good used rear hub (1.770" diameter)



Damage used rear hub (1.763" diameter)

[SIZE="4"]Torque Spec[/SIZE]

One of the reasons for this DIY was to establish a torque spec for the axle nut. Unfortunately, it seems that the axle nut needs to be tightened far beyond what we were able to measure as a result we're continuing to recommend the 12 o'clock to 02 o'clock (60-70 degrees) past factory torque. On my car, we ended up moving the nut 68.1 degrees.



150 ft-lbs, maximum setting on my 1/2" drive torque wrench



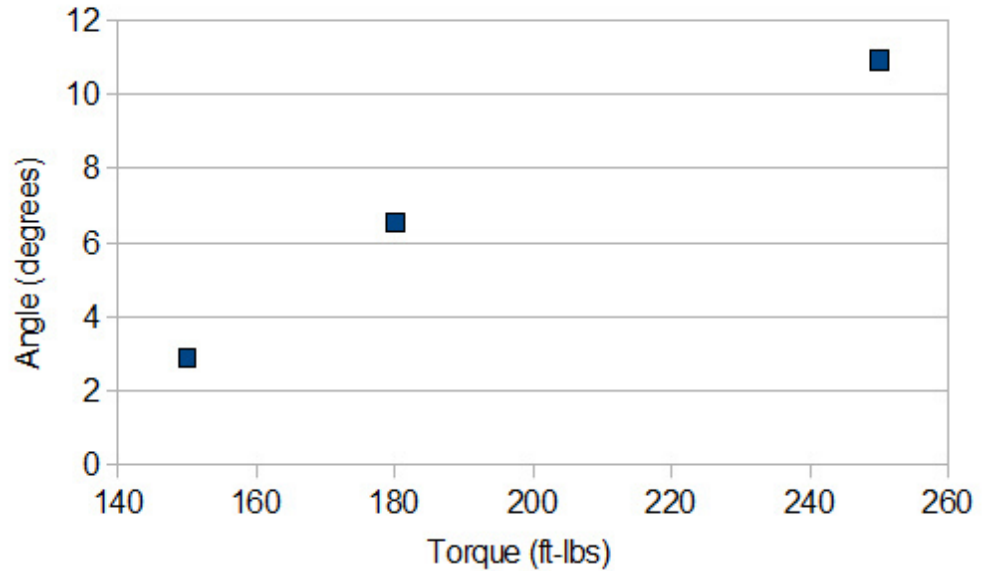
180 ft-lbs, estimated factory torque



250 ft-lbs, maximum setting on Billman's 1/2" drive torque wrench

Torque vs. Angle

S2000 Axle Nut



Graph showing angle from factory position at various torque values

For reference, one [website](#) lists the fully lubricated (both threads and face) torque spec for 24mm Class 8.8 (weak graded metric bolt) fastener as 407 ft-lbs.